

ABSTRACT OF THE DISCLOSURE

Composite materials that can be used to block ultraviolet radiation of a selected wavelength range are disclosed. The materials include dispersions of particles that

5 exhibit optical resonance behavior, resulting in absorption cross-sections that substantially exceed the particles' geometric cross-sections. The particles are preferably manufactured as uniform nanosize encapsulated spheres, and dispersed evenly within a carrier material. Either the inner core or the outer shell of the particles comprises a conducting material exhibiting plasmon (Froehlich) resonance in a desired spectral

10 band. The large absorption cross-sections ensure that a relatively small volume of particles will render the composite material fully opaque (or nearly so) to incident radiation of the resonance wavelength, blocking harmful radiation. The materials of the present invention can be used in manufacturing sunscreens, UV filters and blockers, ink, paints, lotions, gels, films, textiles, wound dressing and other solids having desired

15 ultraviolet radiation-absorbing properties. The materials of the present invention can be used in systems consisting of reflecting substances such as paper or transparent support such as plastic or glass films. The particles can be further embedded in transparent plastic or glass beads to ensure a minimal distance between the particles.